

Editor's note: As protection of the planet's flora, fauna and resources becomes increasingly important, China Daily is publishing a series of stories to illustrate the country's commitment to safeguarding the natural world.



Left: Fishermen haul in a net brimming with fish at an aquaculture base in Jinping, Guizhou province, in May. HU PANXUE / FOR CHINA DAILY



Center: Inspectors check the water quality of the Wuyang River in Yuping, Guizhou, in June. LU ZHONGNAN / FOR CHINA DAILY



Right: A farmer waters seedlings of Dendrobium officinale, a type of orchid often used in traditional Chinese medicine, in Congjiang, Guizhou, in February. LU ZHONGNAN / FOR CHINA DAILY

Revitalized river the source of success

By XU NUO

By integrating ecological river management, water tourism, and the involvement of local villagers in water governance, Longli county in the Qiannan Bouyei and Miao autonomous prefecture of Guizhou province is exploring a model that seamlessly blends water conservation with economic growth.

The Sanyuan River, Longli's largest waterway, flows through Lianhua village, where its wide expanse and crystal-clear waters create a picturesque scene alongside the green mountains. Nearby, visitors set up tents and enjoy barbecues by the riverbank.

"Before 2020, the river's channel was relatively narrow, bordered by farmland, and tourism was sparse," said Deng Maoqin, a staff member with the county's water resources bureau. "The development of tourism and dining was still in its infancy. Local residents mainly relied on farming or sought work in the county town for their income."

Thanks to a pilot project launched in 2020, aimed at integrating water systems and developing scenic water villages, significant efforts have been made to optimize river space, dredge and clean river channels, reinforce riverbanks, and enhance the landscape with local features.

"This project is characterized by a shift from rigid management to ecological management," said Deng. "For example, instead of using grouted rubble to construct river channels, we employed stone-throwing techniques to build embankments, creating a conducive environment for vegetation. We also constructed weirs in the river to increase interaction between people and the water."

The project has benefited 8,202 rural residents and 500 hectares of farmland. Upon completion, it expanded the water area by over 13 hectares, significantly enhancing the water retention capacity and recreational function of the river, according to the bureau.

In 2023, on the back of the achievements of the project, Lianhua village cooperated with private companies to develop cultural and tourism projects. The village contributed land surrounding the river as equity, while the companies took charge of building facilities such as campsites, children's playgrounds, fruit-picking gardens and barbecue areas. The benefits generated are distributed based on a tiered revenue-sharing model, with a minimum dividend of 240,000 yuan (\$33,700) each year for the village collective.

One of the projects, named Four Seasons Floral Wonderland, created seasonal attractions along the river — blossoms in spring, lotuses in summer, reeds in autumn and plums in winter. Last year, it attracted over 10,000 visitors, according to an assistant manager of the project.

"We have outsourced the stalls along the river to professional companies to maximize villagers' earnings," said Yang Guangsong, former first secretary of the village. By the end of last year, the village collective's earnings surpassed 600,000 yuan.

To establish a sustainable management framework, local authorities have encouraged villagers to contribute their own share and reinvest in river governance. The village has allocated a portion of its dividends to hire companies for river cleaning and landscape maintenance. Meanwhile, it has pioneered a community-based river and lake management system, focusing on raising public awareness, enhancing community autonomy, improving problem-solving capabilities, and implementing a reward-and-punishment system.

An incentive system was also introduced to encourage villagers to participate in volunteer river cleaning activities, fostering a new management model where "everyone governs, everyone supervises".

"The changes are evident," Deng said. "In the summer, the riverside in Lianhua village is bustling with people, and locals genuinely care for the river. If someone throws trash carelessly, they're quick to intervene. The river's water quality continues to improve."

Catching every last drop

Guizhou sets about conserving and utilizing valuable resource before it slips underground

By XU NUO in Qiannan, Guizhou
xunuo@chinadaily.com.cn

Despite receiving substantial rainfall, surface water in Southwest China's Guizhou province is scarce. That's because of the province's unique karst limestone landscape, which means as soon as the rain lands, it seeps through the soluble bedrock into the many caves and underground rivers.

This problem is particularly pronounced in Guizhou's rural areas, and so authorities have prioritized large-scale water conservation projects, including building infrastructure and ecological restoration, to improve the environment as well as the livelihoods of locals.

In the village of Cuiwei in Longli county, the rocky mountains have been transformed into valuable assets thanks to a small watershed soil conservation project.

Chen Yingxuan, a staff member at the soil and water conservation station of the Longli county water resources bureau, has been involved with the project since its inception.

"The hill slopes were unsuitable for agriculture, and rain would wash the soil into rivers, worsening siltation and pollution downstream," Chen said.

In 2022, the county piloted an eco-friendly soil conservation project that adopts an integrated approach to the management, maintenance and utilization of mountains.

"Unlike traditional methods that focus solely on controlling soil erosion, this project emphasizes the coordination of soil and water resource protection, and the improvement of residents' living conditions and income," Chen said.

Aligned with general rural revitalization efforts, the project has attracted agricultural companies that have so far planted 34 hectares of economic forests, including honey plums and apples, which are specialties in Guizhou. This practice has addressed slope erosion, protected arable land and led to the planting of over 347 hectares of water conservation forests.

Xie Daojiao, chairman of Longli Shengqi Agricultural Technology Co, said his company has leased



Farmers lead cattle at the top of a waterfall in Longli county, Guizhou province, in July 2023. PROVIDED TO CHINA DAILY

land from the village to grow apples, yellow peaches and honey plums.

"During the first three years of seedling growth, I'm responsible for my own profits and losses," Xie said. "Starting from the fourth year, after the trees begin to bear fruit, I will give annual dividends to the village. We also hire villagers for labor, providing them with wages."

Since the project's inception, the soil erosion control rate in the local watersheds has reached 87 percent, which is considered a very high benchmark, according to the Longli county water resources bureau.

Over the past three years, Longli's forest and grass coverage has increased by 3.14 percentage points. The project has also generated an annual economic benefit of 6.06 million yuan (\$853,000), with a net profit exceeding 1 million yuan, significantly boosting local incomes.

Efficient irrigation

In the Xiaolong irrigation area of Huishui county, the local water authorities have significantly enhanced irrigation and drainage capabilities through renovation projects, transforming outdated,

deteriorating facilities into a modern irrigation system characterized by water-saving measures, ecological management and smart technology.

Large and medium-sized irrigation areas are vital for grain production and food security.

Since its establishment in 1941, the Xiaolong irrigation area had been plagued by severe issues such as channel leakage, siltation and poor water flow. These problems were compounded by incomplete infrastructure, making it challenging to meet local agricultural needs.

In 2024, to address these issues, prefecture-level authorities actively sought national debt funding support for renovation and water-saving projects in the irrigation area, said Shi Bo, a staff member at Huishui county's water resources bureau.

"The project started in March last year and the renovations are estimated to restore and improve irrigation over 4,280 hectares, increase water-saving capacity by 6.4 million cubic meters, and boost grain production by 770,000 kilograms," Shi said.

The project covers 3,800 hectares

of high-standard farmland with an 88 percent coverage rate, effectively ensuring food security in the region, he added.

The enhanced water resources have already led to benefits downstream.

Huishui County Jiaqi Aquatic Products Breeding Co, a sturgeon farming company located in the Xiaolong irrigation area, is one such example.

"The water infrastructure here is much improved," said company representative Chen Ke. "The water flowing through the Xiaolong irrigation area is pure, with suitable temperatures and ample supply year-round, making it ideal for raising high-quality sturgeon."

The company produces an average of 800 metric tons of sturgeon annually, and breeds over 5 million sturgeon fry, demonstrating the positive impact of improved water management on local aquaculture and agriculture.

Green generation

In another project, the Guanyinyan Hydropower Station, located on the main channel of the Wuyang River in Shibing county, has also

benefited. It has set a benchmark in enhancing the utilization of hydropower resources and restoring river ecology with the installation of cutting-edge ecological-flow turbines.

Ecological flow refers to the minimum water flow required to sustain or restore the fundamental structure and function of river ecosystems. Located at the largest reservoir by capacity in Guizhou province, the Guanyinyan Hydropower Station previously released ecological flows directly through the dam's sluice gates or bottom outlets.

However, this approach often resulted in damage to the gates due to prolonged impact, leading to economic losses. Moreover, substantial volumes of water bypassed the turbines, squandering potential electricity generation.

In 2021, an investment of 15 million yuan was made in the station to install a 2,000-kilowatt eco-turbine. This allows for the concurrent generation of electricity while releasing 4.75 cubic meters of ecological flow per second into the river.

The process involves channeling water through the eco-turbine to generate electricity before it enters the river, thus ensuring both ecological and economic gains. This method has resulted in nearly 20,000 yuan in additional daily revenue compared to the previous system of opening the sluice gates.

Long Guangquan, manager of the Shibing branch of Qianshui electric power company, said the new turbine has made life a lot easier.

"The previous turbines required a flow of 17 cubic meters per second to generate electricity, which was only feasible during the flood season," Long said. "During low-water periods, maintaining ecological flow meant we couldn't continuously store water for power generation, making operations challenging."

With the introduction of the eco-turbines, electricity can be generated through ecological flows, which contributed a production value of 6.02 million yuan in 2023 while maintaining essential ecological flow. The Guanyinyan Hydropower Station has been designated as a "Green Small Hydropower Demonstration Station" by the Ministry of Water Resources.

Watershed grows green shoots in rural Guizhou

By XU NUO

"Sunshine and sweat have finally yielded a sweet harvest — this year we have apples to enjoy," wrote Xie Daojiao, chairman of an agricultural company in Longli county, Guizhou province, while sharing photos of apple-laden trees on his WeChat moments.

Three years have passed since Xie's company leased some 73 hectares of land in two mountainous areas in Wantanhe town, where they planted local specialty fruit trees, including apple, honey plum and yellow peach saplings.

In 2022, an ecological small watershed management project was launched in the county and as part of the measures to control soil erosion. Xie's company, Longli Shengqi Agricultural Technology Co, signed a 20-year land lease agreement with the local village.

"The village provided land on barren hills for our company to plant fruit trees. After the trees bear fruit, we distribute dividends to the



Xie Daojiao (right) checks on the growth of vegetables at a greenhouse of his company in Longli county, Guizhou province. PROVIDED TO CHINA DAILY

village on a gradually increasing scale, while also employing villagers to manage the orchards," Xie said.

By cultivating economic fruit forests, Xie's company has transformed barren hills into valuable assets, achieving both economic value and ecological benefits. "The

roots of the fruit trees enhance soil resistance to erosion and reduce the risk of soil and water loss. On the other hand, our company generates revenue, and the local village receives dividends from the trees. It's a win-win situation," Xie said.

However, planting trees in the

mountains is no easy task, as the thin soil layers on slopes and Guizhou's heavy rainfall present challenges.

"Without proper management, the soil's low organic content can lead to root rot in the saplings," Xie said. "Therefore, we dedicated three years and took on the financial risk ourselves to let the roots of the saplings develop and absorb nutrients, which helps ensure the fruits are large, tasty and produced with a high yield."

"As an agricultural professional, transforming seedlings into bountiful harvests is what brings a sense of pride in agriculture," he added.

Xie's family has been engaged in agriculture for generations. In 2015, he first visited Wantanhe town to sell agricultural supplies. Impressed by the region's excellent ecological environment, with a river flowing alongside the farmland and an improved local transportation network, he decided to establish an agricultural company to cultivate vegetables there.